BOARD OF COUNTY COMMISSIONERS
AGENDA ITEM SUMMARY

MEETING DATE: 12/21/05

DIVISION: COUNTY ADMINISTRATOR

BULK ITEM: No, Time Approximate – A.M.

DEPARTMENT: AIRPORTS

STAFF CONTACT PERSON: Peter Horton

AGENDA ITEM WORDING: Presentation by Mike Thompson, of URS, concerning the Marathon Airport Master Plan.

ITEM BACKGROUND: The Federal Aviation Administration has not approved the Marathon Airport Master Plan due to th Runway/Taxiway separation issue. The FAA wishes a recommendation from the County to resolve RW/TW separation noncompliance. The FAA will not accept a recommendation of 'no action'.

PREVIOUS RELEVANT BOCC ACTION: Approval to submit Passenger Facility Charge Application # 5, 1/2/01, and Passenger Facility Charge Application # 8, 10/15/03.

CONTRACT/AGREEMENT CHANGES: N/A

STAFF RECOMMENDATION: N/A

TOTAL COST: N/A

BUDGETED: N/A

COST TO AIRPORT: N/A
COST TO PFC: N/A
COST TO COUNTY: N/A

SOURCE OF FUNDS: N/A

REVENUE PRODUCING: N/A

AMOUNT PER MONTH /YEAR:

APPROVED BY: County Attorney N/A OMB/Purchasing N/A Risk Management N/A

AIRPORT DIRECTOR APPROVAL _____
Peter J. Horton

DOCUMENTATION: Included X Not Required

AGENDA ITEM # _____

DISPOSITION: _____

/bev
APB

FLORIDA KEYS
MARATHON AIRPORT

AIRFIELD DESIGN ALTERNATIVE STUDY

PREPARED FOR

MONROE COUNTY
BOARD OF COUNTY COMMISSIONERS

OPERATOR OF

FLORIDA KEYS
MARATHON AIRPORT

PREPARED BY

URS

November, 2005

AIRFIELD DESIGN ALTERNATIVES
Florida Keys Marathon Airport Marathon, Florida
November, 2005

Introduction

The alternative airfield development analysis described in this report attempts to identify and quantify various runway/taxiway configurations that, if constructed, would possibly eliminate or mitigate one or more non-standard airport design conditions at the Florida Keys Marathon Airport.

Historical Background

The Florida Keys Marathon Airport is a "Public-Owned", "Public Use" airport licensed by the Florida Department of Transportation. Until 2003, the airport served as a limited F.A.R. Part 139 Air Carrier Airport providing scheduled air service to residents of the lower and middle Florida Keys.

The existing airfield layout and geometric centerline separations are the result of several modifications and improvements made to the single-runway landing strip originally developed in 1943 by the U.S. Navy to serve their training needs during World War II. A full-length parallel taxiway (Taxiway Alpha or "A") was constructed along the southeast ("south") side of the runway and has a runway-to-taxiway centerline separation distance of 150 feet. At the request of the Federal Aviation Administration's (FAA), the runway was subsequently relocated 50 feet to the northwest ("north") to provide the current centerline separation of 200 feet and the runway pavement was reduced to its current width of 100 feet.

Federal Aviation Administration Airport Design Criteria

Airport facilities are typically designed for a specific aircraft known as the "design" aircraft, which is the most operationally and/or physically demanding aircraft to make substantial use of the airport. The design aircraft is used to establish the dimensional requirements for safety parameters such as lateral clearance for runways, taxiways and aircraft parking positions, and obstacle clearances. In some cases, the design aircraft may be selected to represent the most demanding from the consideration of airfield geometric design such as largest anticipated wingspan or tail height. Other considerations may be include the various landing gear configuration of certain aircraft and its affect on the load bearing capabilities of various runway and taxiways pavements, apron areas and/or aircraft parking hardstands.

For the purposes of assessing alternative airfield development alternatives at the airport that would fully satisfy FAA design standards, the proposed airfield improvements follow the design criteria prescribed in the FAA's Advisory Circular 150/5300-13, *Airport Design*, (Changes 1 through 9 inclusive).

The Airport Design Circular prescribes the FAA's Airport Reference Coding (ARC) system that is used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. The ARC has two components relating to the airport design aircraft. The first component, designated by a letter, is the *Aircraft Approach Category* and relates to aircraft approach speed (operational characteristic). The second component, designated by a Roman numeral, is the *Airplane Design Group* and relates to airplane wingspan (physical characteristic). Generally, runway standards are related to aircraft approach speed, airplane wingspan, and designated or planned instrument approach capabilities.

The airport is currently designated as having Airport Reference Code (ARC) B-II airfield design geometry that typically accommodates aircraft having design characteristics that include landing approach speeds of 91 knots or more, but less than 121 knots and wingspans of 49 feet, but not including 79 feet. Current FAA airport design standards require that ARC B-II airports provide a minimum runway-to-taxiway centerline separation of 240 feet. The existing runway-to-taxiway centerline separation is 200 feet and is therefore does not satisfy current FAA design standards.

In an effort to formerly address these non-standard conditions, the FAA has approved the following Modifications to FAA Airport Design Standards for the Florida Keys Marathon Airport:

1. *Runway to Taxiway Separation at 200 feet*. FAA approved by letter dated May 18, 1983.

2. *No Aircraft with More Than 38.5 ' Overhang* FAA approved by letter dated May 18, 1983.

3. *Prior Permission Required For Aircraft Greater Than 79' Wingspan* Exception Number: FAR-139-94-ASO-04

4. *Obstruction Lighting Within Transitional Zones Will Not Be Required Outside of 250 Feet Each Side Of Runway Centerline* FAA approved by letter dated February 1, 1994

Alternative Airfield Development Analysis

The following sections of this Study report describe three potential airfield development alternatives that, if undertaken, would serve to remedy existing nonstandard airport design conditions that are primarily rated to the non-standard runway-to-taxiway centerline separation. Airfield development three scenarios developed as part of this Study are described as Alternatives 2, 3 and 4. Each development scenario attempts to fully accommodate Airplane Design Group (ADG) II taxiway and taxilane separation standards that provide the required minimum runway-to-taxiway centerline separation of 240 feet. A fourth "Null" or "Do Nothing" alternative (Alternative 1) was also examined. Each airfield development scenario is depicted at the end of this Study report.

For the purpose of this analysis, it is assumed that all existing and future apron taxilanes under the direct control of the airport's two Fixed Base Operators (FBOs) Marathon Jet Center and Paradise Jet Support would be marked, striped and configured to fully accommodate unrestricted taxi operations by aircraft having ADG II characteristics. This assumption requires that certain existing aircraft tie-down spaces will be eliminated to accommodate the unrestricted airport taxi movement of aircraft having B-II wingspan characteristics. The resultant financial and/or operational impacts that might be imposed upon each FBO as a direct result of these actions are unknown. For example, if the FBO revenues are increased as a direct result of the servicing of larger B-II business jet aircraft, the financial revenues may serve to offset the loss of tie-down revenue. For the purpose of this Study, only the anticipated loss of tie-down revenue is considered.

Considerations for Potential Environmental Impacts

Tree Impacts Requiring Clearing and Grubbing

As part of Alternatives 3 and 4, preliminary cost estimates were developed that represent anticipated tree removal, clearing and grubbing required to fully satisfy FAA design criteria. For the purposes of cost estimating, tree replacement was calculated assuming a tree density of one tree (with a trunk diameter of greater than 4 inches) per four square feet of hammock. These tree clearing actions however, could be in conflict with existing Monroe County Code as cited as *General Ordinances of the County, Chapter 9.5 Land Use Regulations, Article VII Land Use Districts, Division 8 Environmental Standards*, Sections 9.5-346 and 347, *Transplantation Plan and Open Space Requirements* respectively with regard to maintaining at least 80% of the existing hardwood hammock as open space. It should be emphasized that the cost estimates provided in this document are solely for tree removal and relocation costs.

Wetland Mitigation

Based on review of aerial and site photographs and the Soil Survey of Monroe County, Keys Area, Florida (NRCS, 1995), a jurisdictional wetland consisting of an open water "salt pond" and mangrove forest is located in the vegetated area located in the northwest corner of the airport. A discussion of possible impacts to the wetland and potential mitigation requirements and costs are provided for Alternatives 3 and 4.

The state of Florida utilizes the Uniform Mitigation Assessment Methodology (UMAM) to determine mitigation requirements for wetland impacts. UMAM was developed to fulfill the mandate of subsection 373.414(18), F.S., which requires the establishment of a uniform mitigation assessment method to determine the amount of mitigation needed to offset adverse impacts to wetlands and other surface waters. The methodology, as described in Chapter 62-345, F.A.C., provides a standardized procedure to be used by all state and local agencies for assessing the functions provided by wetlands and other surface waters, the amount that those functions are reduced by a proposed impact, and the amount of mitigation necessary to offset that loss. This methodology typically results in mitigation requirements for impacts to mangrove forests and estuarine areas to be in the range of 3:1 to 5:1 (mitigation: impact) for wetland creation and restoration. For the purposes of this analysis, it is assumed that a 4:1 mitigation ratio will be required.

In March 2003, URS prepared a Feasibility Study for Monroe County for the Key West International Airport. In this Study, eighteen (18) mitigation sites located in the lower and middle Keys were identified and cost estimates were prepared. Four (4) of the potential mitigation sites are located in the vicinity of Marathon and are being utilized in this assessment to determine potential mitigation costs. The cost estimates for these four sites have been updated assuming a 3% annual inflation factor. The average cost for one (1) acre of mitigation was determined to be approximately $111,700. Three of the four potential mitigation sites are public lands and would not require land acquisition. Mitigation costs would be higher if land acquisition is needed. Land costs for parcels comparable in size for what would be needed for this project averaged approximately $450,000 per acre.

Monroe County Code provides for the conservation and protection of the environmental resources of the Florida Keys by ensuring that the functional integrity of natural areas is protected when land is developed. Clearing of the upland hammock could be in conflict with the Monroe County Code cited as General Ordinances of the County, Chapter 9.5 Land Use Regulations, Article VII Land Use Districts, Division 8 Environmental Standards, Sections 9.5-346 and 347, Transplantation Plan and Open Space Requirements. A previous cost estimate for tree removal and relocation costs in accordance with Monroe County Code was performed by URS. These cost estimates are also included as part of this Study report.

Alternative 1 - Do Nothing

This alternative assumes that no modifications to the existing airfield are undertaken and the existing non-standard 200-foot runway centerline-to-taxiway centerline condition remains unchanged. No construction, demolition or disturbances and/or impacts to environmentally-sensitive land areas situated along the north side of Runway 7/25 or to existing structures, aircraft parking positions or apron areas south of the runway would occur. The existing vegetative and environmentally-sensitive land areas located parallel and northwest of the runway would remain outside the limits of the Runway Object Free Zone (OFZ) and the Runway Object Free Area (ROFA)

As part of this "Do Nothing" alternative, it is assumed that the Marathon Jet Center Apron is marked and striped to fully accommodate unrestricted ADG B-II taxiing aircraft movements along the entire length of the north side of the apron. For geometric analysis considerations only, a future ADG B-II apron taxilane across the entire north side of the Paradise Jet Support apron was assumed to be in place and was assessed for potential operational and economic impacts to the FBO's ADG A/B-I operations and tie down positions.

Associated Impacts:

- Associated Construction: No construction, demolition or disturbance of natural or man-made environs would occur.
- Existing Structures: No existing buildings, structures or facilities would be disturbed, relocated or removed.
- Marathon Jet Center Apron/Operations: No changes to current operational practices would occur.
- Paradise Jet Support Apron/Operations: No changes to current operational practices would occur. (Not considering the development of an ADG B-II taxilane along the full length of apron.)
- Passenger Terminal Apron/Operations: No changes or operational impacts to the use of the terminal apron area would occur. Occasional operations by regional jet aircraft having dimensional characteristics larger than B-II wingspans could occur.
- Environmentally-Sensitive Land Areas: No disturbances or impacts to mangroves, hardwood hammocks, wetlands or the salt pond would occur.

Anticipated Cost:

This alternative has no associated construction, relocation, or environmental mitigation costs.

Alternative 2 - Relocate Taxiway Alpha South

This alternative provides the required 240-foot runway-to-taxiway centerline separation by relocating the Taxiway "A" centerline 40 feet to the south. This proposed action would require the widening of the south edge of the Taxiway "A" to provide an overall ARC B-II taxiway pavement width of 35 feet. Accordingly, the associated ADG B-II Taxiway Safety Area (TSA) and Taxiway Object Free (TOFA) would be shifted 40 feet south. The existing vegetative and environmentally-sensitive land areas located parallel and northwest of the runway would remain outside the limits of the Runway Object Free Zone (OFZ) and the Runway Object Free Area (ROFA)

Associated Impacts:

- Required Reconstruction of Taxiway "A": The entire length of Taxiway A's full strength pavement would be reconstructed 40 feet to the south to provide an overall taxiway pavement width of 35 feet and a shoulder width of 10 feet. The full strength taxiway pavement construction would occur to a width of 32.5 feet along the south side of the existing taxiway. Where required, 10-foot paved shoulders would be developed along the south side. The relocated taxiway would be marked and striped to fully accommodate ADG B-II operations. All taxiway edge lights would require relocation to within 10 feet of the newly established full strength taxiway pavement edge.

- Existing Structures: The relocated TOFA would extend 15 feet beyond the western-most extent of four (Phase I) T-hangars that are situated along the south side of Taxiway "A".

- Impacts to Development of Phase II Future T-Hangars: The relocated TOFA would impact the planned Phase II T-Hangar development planned immediately south of the existing four T-hangars. The hangar units and associated storage closets would be eliminated. The rental rate for the existing T-hangar units is $450 per month. The T-hangars have an estimated useful life of 28 years. The rental rate for the four end storage closets having the same useful life is $100 per month. Applying the monthly rental rates, the associated financial impacts to the owner/operators would be approximately $739,200 over the remaining 28-year useful life of the existing T-hangars

- The same impacts would be associated with the planned four additional multi-unit T-hangar structures that are planned west of the existing T-hangars. Applying the same monthly rental rates the associated financial impacts to the owner/operators would be approximately $792,000 over the 30-year useful life of the future affected T-hangars

- Impacts to Future Fire Station Operations: The relocated TOFA would impact the planned operation of a new fire station and supporting apron area adjacent to Taxiway "A". The expanded TOFA would preclude the temporary or parking of various fire truck and/or equipment in areas directly behind the Fire Station building.

- Marathon Jet Center Apron/Operations: The required ADG B-II 105-foot taxiway centerline-to-apron-edge taxilane centerline separation would require that the ADG B-II taxilane be shifted southward impacting (4) four ADG A/B-I tiedown positions. Based on current (2005) monthly tie-down fees charged by the FBO, it is anticipated that the FBO (or future FBO) would incur revenue impacts directly related to the lost of tie-down locations in the neighborhood of $144,000 over a 30-year period.

- Paradise Jet Support Apron/Operations: Relocated ADG B-II TOFA would require elimination of 16 apron-edge tiedown positions and 11 additional apron tie-down positions. Using the same monthly tie-down fee rates, it is anticipated that the FBO (or future FBO) would incur revenue impacts directly related to the lost of tie-down locations in the neighborhood of $972,000 over a 30-year period.

- Passenger Terminal Apron/Operations: The anticipated occasional itinerant operations by aircraft having ADG C/D-II characteristics (e.g., typical Regional Jet) would generate wingtip penetrations of the relocated ADG B-II TOFA. Itinerant operations of aircraft having ADG B-I characteristics (e.g., Beechcraft 1900 airliner) would not generate wingtip penetrations of the relocated TOFA.

- Environmentally-Sensitive Land Areas: No disturbances or impacts to mangrove wetlands, hardwood hammocks or the salt pond would occur. Consequently, there would be no costs associated with tree removal and replacement, wetland mitigation or organism relocation.

- Preclude or Severely Impact the Resumption of FAR Part 121 Air Carrier Operations: Following the cessation of air carrier service in 2003, Monroe County has actively pursued all viable avenues to reinitiate air carrier service. Monroe County has submitted a total of three Small Community Air Service grant applications and has all reason to believe that such efforts will serve to attract and retain scheduled air carrier service to serve the air traveling needs of residents of the lower and middle Florida Keys.

Anticipated Cost:

The estimated direct costs developed for this analysis are limited to the relocation of the Taxiway Alpha full strength pavement, shoulders and taxiway edge lighting. The estimated construction costs limited only to the relocation of Taxiway Alpha is $4,988,914.

Other economic impacts include, but are not be limited to the two Fixed Base Operators tie-down revenue loss of approximately $1,116,000, and unquantifiable impacts to certain Federal Aviation Regulations Part 121 and/or Part 135 commercial operations (i.e., Regional Jets and or other charter operations) at the passenger terminal airside apron. The associated impacts to the resumption of Federal Aviation Regulations (F.A.R.) Part 121 or Part 135 operations can not be estimated at this time, but would include lost financial opportunities to the airport and economic generation impacts to the lower Florida Keys. An economic revenue loss of approximately $739,200 would be associated with the required demolition of the four western-most T-hangar bays and corner storage areas to avoid impacts to the Taxiway Alpha Object Free Area and to Aircraft Rescue and Firefighting facility apron operations. Similar lost revenue impacts of approximately $792,000 would also be incurred for the planned four additional multi-unit T-Hangar facilities. No environmental mitigation or environmental permitting costs are anticipated for this alternative.

Monroe County's Rejection of Alternative 2

The numerous operational, financial and economic impacts associated with this alternative as viewed from the perspective of Monroe County (Owner/Operator of the airport) are considered to render Alternative 2 non-viable or impracticable.

Alternative 3 - Relocate Runway 7/25 North

This alternative provides the required 240-foot runway-to-taxiway centerline separation by relocating the entire Runway 40 feet to the north. This would require the complete reconstruction of runway pavement and shoulders to provide an overall full strength runway pavement width of 100 feet and shoulder width of 10 feet. Accordingly, the associated ADG B-II Runway Safety Area (RSA) and Runway Object Free (ROFA) area setbacks would be shifted 40 feet to the north. Portions of the existing vegetative and environmentally-sensitive land areas located parallel and northwest of the runway would be located within the limits of the Runway Object Free Zone (OFZ) and the Runway Object Free Area (ROFA)

Associated Impacts:

- Associated Construction: The entire length of Runway 7/25 full strength pavement would be reconstructed to relocate the runway centerline 40 feet to the north and to provide an overall runway pavement width of 100 feet. Where required, 10-foot paved shoulders would be developed along the north side of the runway pavement edge. All runway edge lights would require relocation to within 10 feet of the newly established full strength runway pavement edge.

- Existing Structures: No man-made structures or facilities would be impacted by the northward relocation of the runway.

- Marathon Jet Center Apron/Operations: No adverse operational or financial impacts are anticipated to occur.

- Paradise Jet Support Apron/Operations: Establishment of ADG B-II apron taxilane would eliminate 17 apron-edge tiedown positions. Revenue to the FBO typically generated by the seasonal or year-round rental of these tie down positions would be lost. It is anticipated that the FBO (or future FBO) would incur revenue impacts directly related to the lost of tie-down locations in the neighborhood of $612,000 over a 30-year period.

- Terminal Apron/Operations: No adverse operational or financial impacts are anticipated to occur.

- Environmentally-Sensitive Land Areas: The relocated Runway Object Free Area (ROFA) would extend 40 feet beyond the current 250-foot runway centerline-to-vegetation clearing line. This would require that all wetland areas and upland hammock located within 250 feet of the relocated runway centerline be impacted to satisfy the object free requirements. This would result in an impact to approximately 1.0 acre of the wetland located in the northwest corner of the airport. Mitigation would be required to compensate for the wetland impact.

Anticipated Cost:

This alternative presents the highest relative cost associated with the relocation of Runway 7/25 centerline, pavement edge expansion and edge lighting. The estimated direct costs developed for this analysis are limited to the relocation of the runway 40 feet to the north is $9,628,344.

Other economic impacts to the tie-down revenue for Paradise Jet Support are anticipated to be approximately $612,000 over a 30-year period.

This alternative would result in approximately 1.0 acres of wetland impact. Approximately 4.0 acres of wetland creation should be required for mitigation. The wetland mitigation construction would cost approximately $446,800. Land acquisition for approximately 4.0 acres would cost approximately $1,800,000. This is in addition to the estimated $9,600,000 for costs related to tree removal, clearing, grubbing, and canopy replacement per Monroe County Code.

Alternative 4 - Relocate Runway 7/25 North and Taxiway Alpha South

This alternative provides the required 240-foot runway-to-taxiway centerline separation by relocating Runway 7/25 centerline 15 feet to the north and the Taxiway "A" centerline 25 feet to the south. The north edge of the runway and south edge of the taxiway would be widened to provide 100-foot and 35-foot pavement widths respectively. The existing vegetative and environmentally-sensitive land areas located parallel and northwest of the runway would remain outside the limits of the Runway Object Free Zone (OFZ) and the Runway Object Free Area (ROFA)

This alternative fully avoids impacts to existing structures located south of Taxiway "A", but imposes certain impacts to mangroves and portions of the hardwood hammock north of the runway. The relocated Taxiway "A" centerline would be established by placing the southern-most extent of the ADG B-II Taxiway "A" TOFA along the face of the four T-hangar buildings.

Associated Impacts:

- Associated Construction: The Runway 7/25 centerline would be relocated 15 feet to the north and the full strength pavement and 10-foot shoulders widened to the north by 15 feet accordingly. The Taxiway "A" centerline would be relocated 15 feet to the south, but the full strength taxiway pavement and associated shoulders widened only 17.5 feet to the south to provide an overall ARC-B-II taxiway width of 35 feet. All runway and taxiway edge lights would require relocation to within 10 feet of the newly established full strength runway pavement edges.

- Existing Structures: No impacts to existing man-made structures or facilities would occur.

- Marathon Jet Center Apron/Operations: The relocated Taxiway "A" centerline would require a relocation of the Marathon Jet Center ADG B-II apron taxilane centerline thus requiring the elimination of four ADG A/B-I tiedown positions. It is anticipated that the FBO (or future FBO) would not incur revenue impacts directly related to the lost of tie-down locations.

- Paradise Jet Support Apron/Operations: Establishment of ADG B-II apron taxilane would eliminate 16 apron-edge and 12 additional apron tiedown positions. It is anticipated that the FBO (or future FBO) would incur revenue impacts directly related to the lost of tie-down locations in the neighborhood of $1,008,000 over a 30-year period.

- Terminal Apron/Operations: Itinerant operations by Regional Jets or Beechcraft 1900 at the Terminal Building apron would not be adversely impacted.

- Environmentally-Sensitive Land Areas: The relocated ROFA would extend 15 feet beyond the current 250-foot runway centerline-to-vegetation clearing line. This would require that all wetland areas located within 250 feet of the relocated runway centerline be impacted to satisfy the object free requirements. This would result in an impact to approximately 0.4 acres of the wetland located in the northwest corner of the airport. Mitigation would be required to compensate for the wetland impact.

Anticipated Cost:

This alternative presents the second highest relative cost associated with the relocation of Taxiway "A" centerline, Runway 7/25 centerline; respective pavement edges expansions and edge lighting relocations. The estimated construction costs limited only to construction is 13,966, 472.

Economic impacts to the tie-down revenue for Paradise Jet Support are anticipated to be approximately $ 1,008,000 over a 30-year period.

This alternative would result in approximately 0.4 acres of wetland impact. Approximately 1.6 acres of wetland creation should be required for mitigation. The wetland mitigation construction would cost approximately $178,720. Land acquisition for approximately 1.0 acres would cost approximately $450,000. This is in addition to the estimated $3,600,000 for costs related to tree removal, clearing, grubbing, and canopy replacement per Monroe County Code.

FAA Study Review and Comments

During the course of this Study, the FAA Airports District Office located in Orlando, Florida reviewed the four airfield design alternatives. As part of that review, the FAA has taken the unwavering position that Alternative 1 (Null or Do Nothing) was not considered to be acceptable from a safety standpoint and that all measures should be made by Monroe County to remedy the existing non-standard airfield design conditions.

The various physical and financial impacts associate with the remaining three alternatives were thoroughly investigated and evaluated by URS, representatives of the airport and the FAA. Through this collaborative review process, it became evident that each of the remaining airfield design alternatives would: 1) derogate the airport's ability to adequately accommodate existing or future anticipated levels of air service, 2) create financial impacts to Monroe County and its existing airport tenants and stakeholders, and 3) create impacts to environmentally-sensitive land areas on the airport.

The FAA recognized that because of the limited geographic area within which the airport operates, the relocation of Taxiway Alpha to the south (regardless of distance) would severely impact existing operations as well as to possibly preclude the resumption of schedule air carrier operations at the airport in the future.

Study Findings and Recommendations

Study Findings

It is apparent that any modifications to the existing runway/taxiway layout at the Florida Keys Marathon Airport to fully satisfy current FAA design standards will carry a high price tag. Beyond the obvious cost of relocating and redesigning airfield pavements, other associated costs would include operational and financial impacts to the airport's two Fixed Base Operators, physical impacts to existing T-hangars and the associated loss of T-hangar revenue, disruption of airport operations and/or the potential need to close the airport during critical phases of construction.

The issue of current Monroe County codes that prescribe environmental impact limits to the hardwood hammocks and the anticipated associated mitigation costs will serve to further raise the "cost" bar. One major issue that remains critical to the feasibility of the "Action" Alternatives 3 or 4, centers on the question of hardwood hammock impacts, specifically whether Monroe County would permit this amount of hammock removal and, even if permitted, would the County's requirement to maintain at least 80 percent of the hammock as open space be met.

Other areas of critical concern center on the need to maintain access to the nation's system of airports. The Florida Keys Marathon Airport is considered a vital community asset that serves the safety, welfare and economy of the lower and middle Florida Keys. Loss of this airport during the Hurricane Season or other relief support efforts following a natural disaster would be problematic at best.

There appears to be no quick or economically attractive solution available to remedy the current non-standard runway-to-taxiway centerline separation dilemma at this airport. Based on the preliminary cost estimates provide in this report, the cost will most likely start at around $7.6 million (Alternative 2) and could be as much as $22.1 million (Alternative 3). It should be noted however, that Alternative 2 has no associated environmental mitigation, the remaining impacts and constructions costs do not adequately reflect or quantify the potential economic impacts associated with the potential resumption of scheduled service at the airport.

Study Recommendation

Based on the findings and considerations developed as part of this Study, is recommended that Monroe County request that FAA coordinate an Aeronautical Study to evaluate the proposed shifting of Runway 7/25 40 feet to the north (Alternative 3). The shifting of the runway will require that portions of the existing vegetative and environmentally-sensitive land areas along the north side of the airport be situated within the Runway Object Free Area.

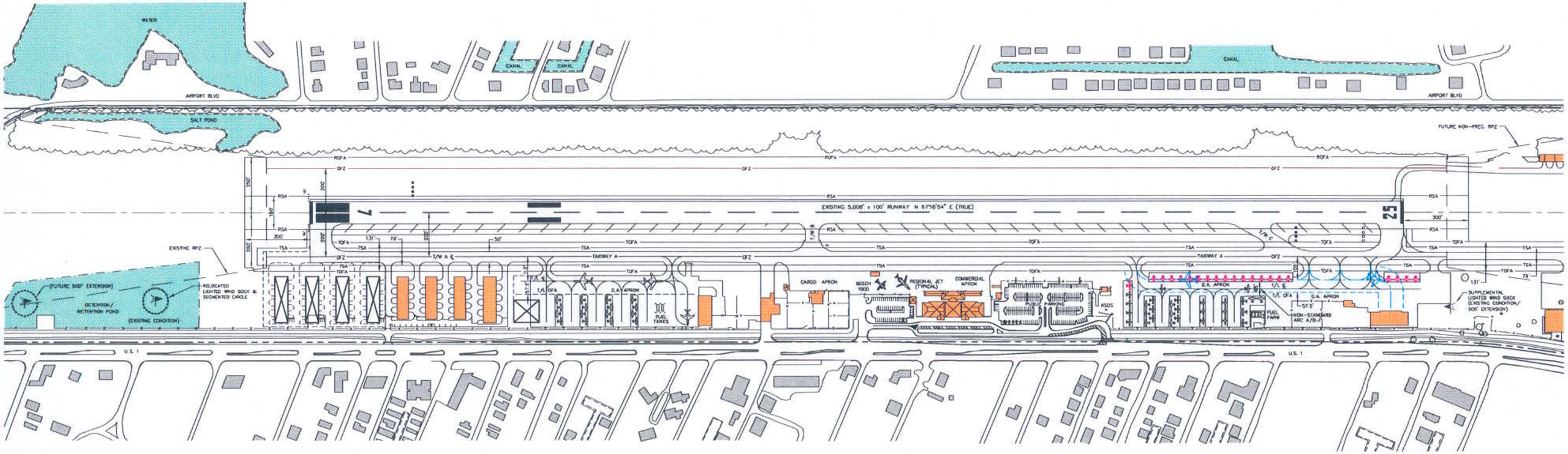
It is also recommended that Monroe County include as part of the request, the stipulation that the Aeronautical Study assess the 40-foot northward shift of the runway without the trimming, removal or disturbance of existing vegetation or environmentally-sensitive land areas north of the runway. As such, the FAA's Aeronautical Study would investigate the potential for impacts to the existing (or potential future) published instrument approach procedures (i.e., cloud ceiling or visibility minima) caused by the presence of the vegetative hammock within the Runway Object Free Area.

If the FAA were to allow for the 40-foot northward shift of the runway without requiring the removal and mitigation of the wetlands and hammock, the overall anticipated total cost of Alternative 3 would be reduced by approximately $11.8 million dollars. This would serve to reduce the overall cost of Alternative 3 from over $22 million to just over $10 million that would be limited to runway reconstruction costs.

Airfield Design Alternative Study Impact / Cost Summary

	Airport Development Alternative			
Associated Impacts	**1**	**2**	**3**	**4**
Airfield Construction	None	$ 4,988,914	$ 9,628,344	$ 13,966,472
Loss of Existing T-Hangar Revenue (4 Units/Storage Closets)	None	$ 739,200	None	None
Loss of Future Existing T-Hangar Revenue (4 Units/Storage Closets)	None	$ 792,000	None	None
Assumed FAR Part 121/135 Financial Impacts	None	High	None	None
Loss of Aircraft Tie Down Revenue - Marathon Jet Center	None	$ 144,000	None	None
Loss of Aircraft Tie Down Revenue - Paradise Jet Support	None	$ 972,000	$ 612,000	$ 1,008,000
Hardwood Hammock Mitigation Impacts	None	None	$ 9,600,000	$ 3,600,000
Environmental Mitigation Land Acquisition	None	None	$ 1,800,000	450,000
Wetland Mitigation Construction	None	None	$ 446,800	$ 178,720
Total Alternative Cost	**None**	**$ 7,636,116**	**22,087,147**	**$ 19,203,196**

Source: URS 2005



LEGEND

- AIRPORT PROPERTY LINE
- EXISTING AIRFIELD PAVEMENT
- EXISTING ON-AIRPORT BUILDING
- EXISTING OFF-AIRPORT BUILDING
- PROPOSED HANGARS
- ROFA — RUNWAY OBJECT FREE AREA
- RSA — RUNWAY SAFETY AREA
- OFZ — OBSTACLE FREE ZONE
- TOFA — TAXIWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- ARC B-II AIRCRAFT APRON EDGE TAXILANE REQUIREMENTS
- IMPACTED ARC A/B-I AIRCRAFT PARKING POSITION

N

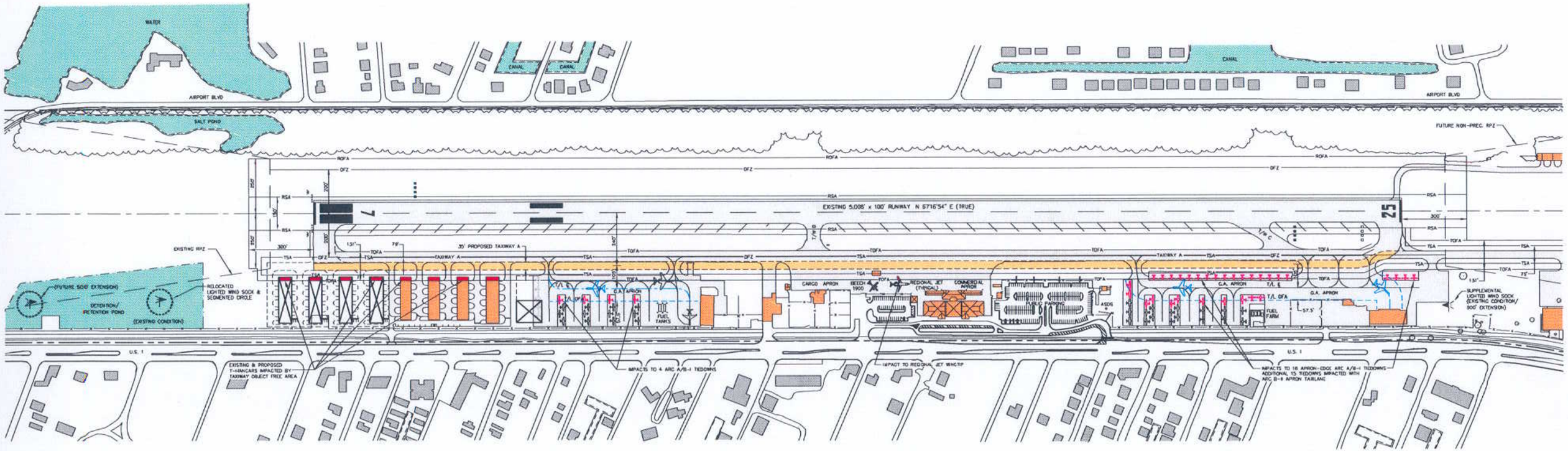
200 0 200 400

GRAPHIC SCALE IN FEET

ALP UPDATE
AIRFIELD STANDARDIZATION
ARC B-II (NON-STANDARD)

ALTERNATIVE 1
NO ACTION

FLORIDA KEYS MARATHON AIRPORT



LEGEND

- AIRPORT PROPERTY LINE
- EXISTING AIRFIELD PAVEMENT
- EXISTING ON-AIRPORT BUILDING
- EXISTING OFF-AIRPORT BUILDING
- PROPOSED HANGARS
- ROFA — RUNWAY OBJECT FREE AREA
- RSA — RUNWAY SAFETY AREA
- OFZ — OBSTACLE FREE ZONE
- TOFA — TAXIWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- DFA — ARC B-II AIRCRAFT APRON EDGE TAXILANE REQUIREMENTS
- PROPOSED TAXIWAY A
- IMPACTED ARC A/B-I AIRCRAFT PARKING POSITION

N

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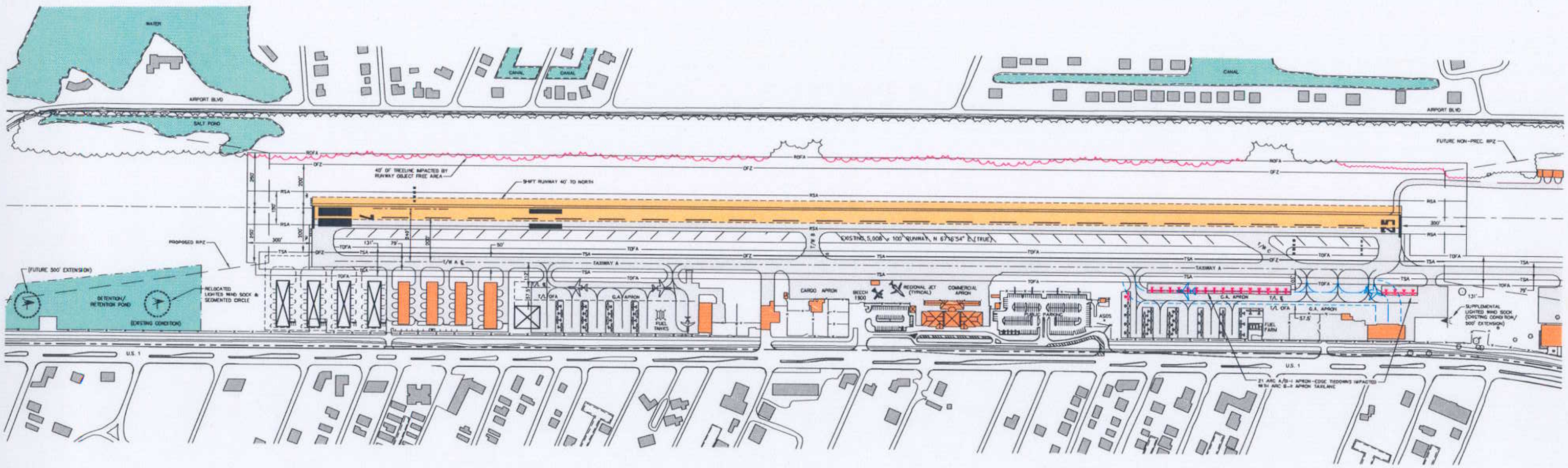
GRAPHIC SCALE IN FEET

ALP UPDATE
AIRFIELD STANDARDIZATION
ARC B-II

ALTERNATIVE 2
SHIFT TAXIWAY A 40 FT. SOUTHEAST

FLORIDA KEYS MARATHON AIRPORT



LEGEND

- AIRPORT PROPERTY LINE
- EXISTING AIRFIELD PAVEMENT
- EXISTING ON-AIRPORT BUILDING
- EXISTING OFF-AIRPORT BUILDING
- PROPOSED HANGARS
- ROFA — RUNWAY OBJECT FREE AREA
- RSA — RUNWAY SAFETY AREA
- OFZ — OBSTACLE FREE ZONE
- TOFA — TAXIWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- OFA — ARC B-II AIRCRAFT APRON EDGE TAXILANE REQUIREMENTS
- PROPOSED RUNWAY
- IMPACTED ARC A/B-I AIRCRAFT PARKING POSITION

N

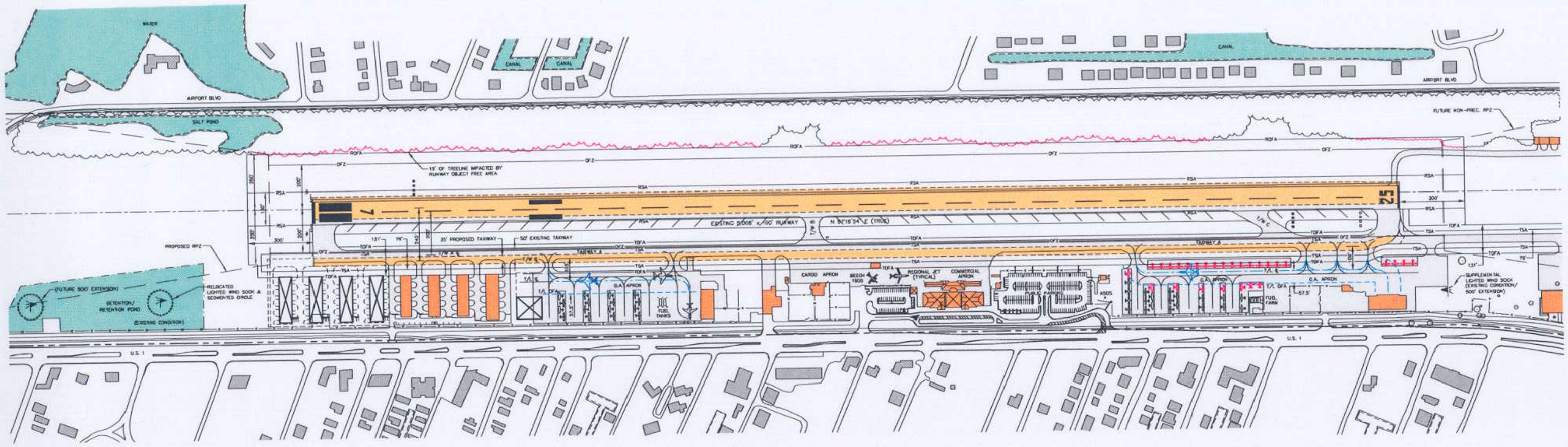
200 0 200 400

GRAPHIC SCALE IN FEET

ALP UPDATE
AIRFIELD STANDARDIZATION
ARC B-II

ALTERNATIVE 3
SHIFT RUNWAY 40 FT. NORTHWEST

FLORIDA KEYS MARATHON AIRPORT
MONROE COUNTY, FLORIDA



LEGEND

- AIRPORT PROPERTY LINE
- EXISTING AIRFIELD PAVEMENT
- EXISTING ON-AIRPORT BUILDING
- EXISTING OFF-AIRPORT BUILDING
- PROPOSED HANGARS
- ROFA — RUNWAY OBJECT FREE AREA
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- TSA — TAXIWAY SAFETY AREA
- ARC B-II AIRCRAFT APRON EDGE TAXILANE REQUIREMENTS
- IMPACTED ARC A/B-I AIRCRAFT PARKING POSITION
- PROPOSED RUNWAY
- PROPOSED TAXIWAY A

N

200 0 200 400

GRAPHIC SCALE IN FEET

ALP UPDATE
AIRFIELD STANDARDIZATION
ARC B-II

ALTERNATIVE 4
AVOIDANCE OF EXISTING STRUCTURES/ RELOCATION OF ALL AIRFIELD PAVEMENTS

FLORIDA KEYS MARATHON AIRPORT
MONROE COUNTY, FLORIDA